

Peter Hansen Hessing - "Hansen's patent"

Sven Erik Jørgensen Editor Dykkehistorisk Tidsskrift
Translated by Lene McCormick



The Danish 2-bolts helmet – also known as “Hansen’s Patent” – was constructed by the “Svitzer” diver Peter Hansen. Hansen’s Patent was a new thinking on the principle of connecting the suit and the helmet as opposed to the heavy diving equipment of the day. With this construction Peter Hansen put Denmark on the map within the development of heavy diving helmets.

Peter Hansen Hessing was born on 30 March 1859 in Snekkersten near Helsingør. He died aged 89 in 1948. When he was 12, Peter Hansen went to sea as a ship’s boy. Not much time for school! In 1882 he married Anna Emilie Larsen (1861-1944) who was the daughter of a pilot in Helsingør. They moved to Copenhagen where they lived in Toldbodgade near Nyhavn. From 1883 to 1903 they had 11 children. During a period of 6 years, all the children lived at home. When there are 13 members of a family and only one income, one needs to be practical. But Peter Hansen knew how to use his hands.

Around 1885, Peter Hansen became an employee of Svitzer. He worked here as a diver until an accident – he was burned by fuel vapors – around 1915 caused him to stop diving. His youngest child, Kaj Hessing (1903-1990) was also a diver and employed by Svitzer from 1932-1970. Kaj Hessing’s father taught him to dive as there was no formal diving training at that time. They would sail out onto Øresund at a depth of 6-7 meters because, as Peter Hansen said, “If you want to learn to dive you need proper water above you!”

From former “Svitzer” divers we have learnt that Peter Hansen was a clever and well-respected diver. When his son sought employment at Svitzer



they remarked “If you are just half as good as your father it will be alright”.

Incidentally, Kaj Hessing’s grandchild, Søren Hessing, trained as a diver at The Royal Danish Navy Diving School (Søværnets Dykkerskole) in 1999 and has been employed at the Danish Maritime Authority (Farvandsvæsenet).

What actually made Peter Hansen construct a new type of helmet is not known. But we will try to guess. Presumably Peter Hansen dived with the different types of helmets used in Denmark at that time, or at least had knowledge of them. The most frequently used helmets were open helmets, 12-bolt helmets and 3-bolt helmets. In order to understand Peter Hansen’s reason to develop a completely new type of helmet, we need to take



Illustration from a leaflet from Franz Clouth showing mounting of the helmet. The collar of the suit is corded up around the divers neck and head to prevent that water standing between the helmet and the suit enter the inside of the suit. The man how hold the helmet is Peter Hansen. The first helmets were tinned on the entire outer surface. This is why the helmet omn the photo looks highly polished.



Postcard showing Peter Hansen in a Macintosh diving suit ready to use a open Sadler helmet.

a look at the advantages and disadvantages of the helmets of that time.

When Svitzer employed Peter Hansen in 1885, the company had closed suits. However, various old illustrations show that open helmets were also in use at that time. At the Industrial Exhibition (Industriudstillingen) in Copenhagen in 1888, an open helmet was used at the Svitzer stand. The diver was Peter Hansen.

A similar open helmet is shown on an old postcard sent 21 May 1907. The postcard shows Peter Hansen in a Macintosh suit ready to be fitted with

an open helmet of the type decorating the gable of the former head quarters of Svitzer in Kvæsthusgade, and of the same type as the one found at the Naval School of Diving (Søværnets Dykkerskole). When the postcard was sent – by Peter Hansen's daughter, Ingeborg – Peter Hansen was 48 years old. Judging by the postcard, Peter Hansen's age is hard to determine, but he appears to be 10-15 years younger. So the picture could be dated around 1892-1897.

Open helmets are known by not being fitted onto a suit, and by the air, which is pumped down to the

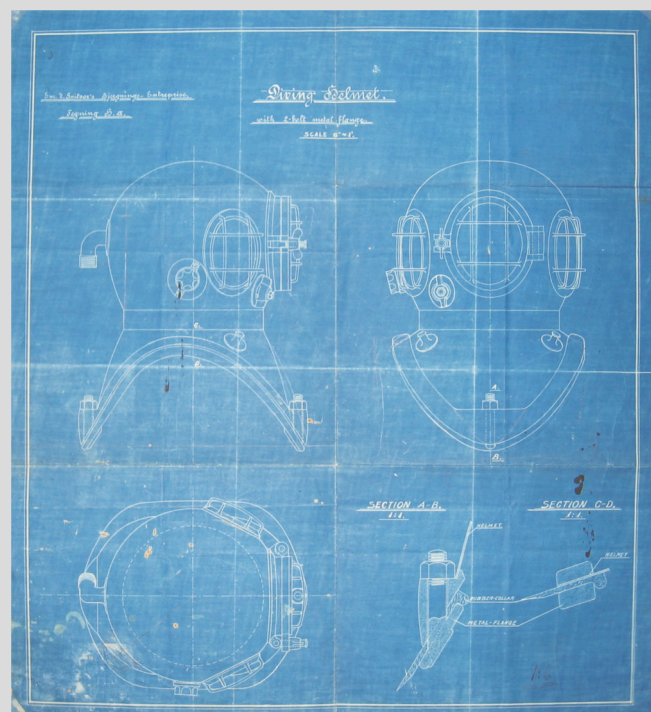
diver flowing under the edge of the helmet. This helmets limit work under water and was unsafe compared by closed suits. Work was normally carried out in an upright position, as the water level would otherwise rise. Furthermore, the water level in the helmet would rise and fall according to the breathing pattern of the diver. On the other hand, the helmet could be fitted quickly. On the breastplate of the helmet, some lead weights would be fixed and on the edge of the breastplate was a canvas shirt, which would be tied around the diver. During breaks the canvas shirt could be quickly untied and the helmet could be fully dismantled.

Together with the suit the 12-bolt helmets made up a waterproof entity once the rubber seal of the suit was placed over the lower part of the breastplate and tightened to this with 4 breastplate straps. Fastening the straps with 12 wing nuts made the joint laborious and timely. Once the breastplate was fixed it would only be demounted if absolutely necessary. During breaks on deck only the helmet would be disconnected and the diver would have to walk around with the heavy breastplate which, obviously, limited his movement.



Peter and Anna Hansen Hessings golden wedding day 10 July 1932. Kaj Hansen is sitting in front row to the left.

The 3-bolt helmets were joined to the suit with a level flange seal. Once the diver was wearing his suit the breastplate would be put onto his shoulders and the rubber neckhole of the suit would be pulled up through the opening in the breastplate and turned over its flange. The opening in the breastplate was small as it was only meant to just fit over the diver's head. The suit's rubber neckhole would be similarly small as it was supposed to fit inside the breastplate's opening. The suit's small opening made it hard to put on. Usually it took 3-4 men to help a diver into his suit by expanding the opening. Even with assistance there was not much of an opening



Dykkehistorisk Selskab is in position of a old blueprint of a 2-bolt helmet. Unfortunately the drawing is undated. Several details on the helmet indicate that it is a very early helmet – maybe the first. The drawing is produced by Em. Z. Svitzer Salvages Company.

12-bolts



3-bolts



2-bolts



to get through. If the diver used separate woolen underwear, the undershirts would sometimes end up under the diver's arms, which meant that this needed to be fixed inside the suit – it cannot have been easy.

Peter Hansen would certainly have seen the various advantages and disadvantages of the helmets and in the light of this thought out a helmet, which united the following:

- The tight flange seal of the 3-bolt helmet
- The large suit opening of the 12-bolt helmet
- The mobility on land of the open helmet

Once Peter Hansen had thought this out Svitzer presumably helped to carry out the necessary drawings – possibly including production of a prototype – and presumably also the later patenting of the helmet in Germany.

The 2-bolt solution was patented at the Kaiserliches Patentamt in Germany on 19 July 1907. In the patent, the advantages of the helmet as opposed to the 12-bolt helmet are described. These included the bolts, which – unlike the 12-bolt helmet's wing nuts – did not catch ropes etc, and the breastring, which was in one piece again unlike the 12-bolt helmet with 4 breastplate straps.

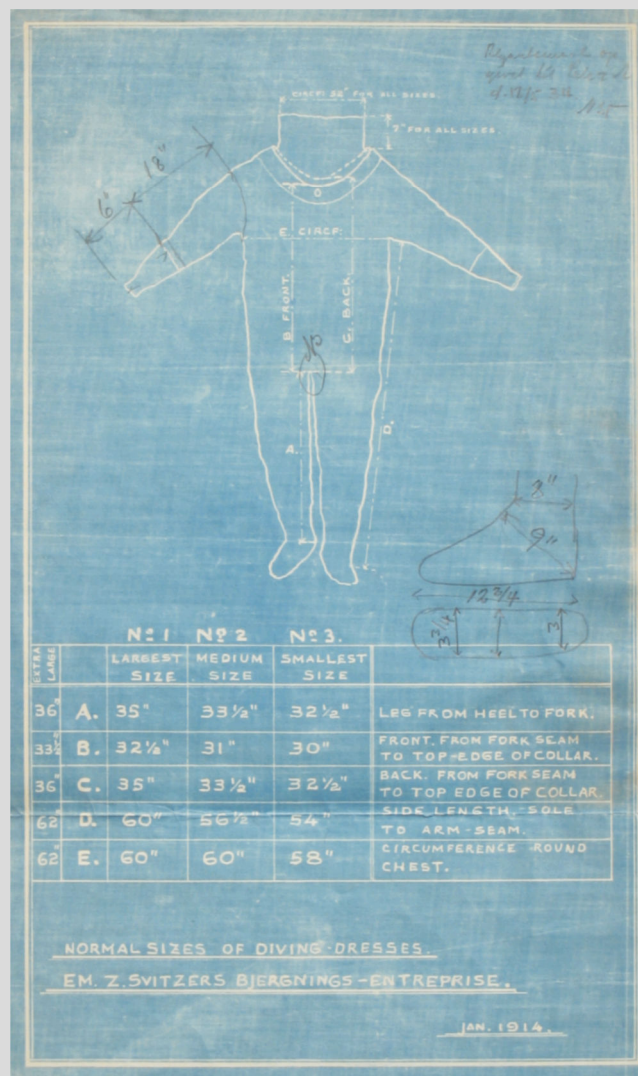
Es sind bereits Taucherausrüstungen bekannt, bei denen der Mantelkragen zwischen dem Rand des Helms und dem unterhalb des Helmrandes befindlichen, mit Befestigungsschrauben versehenen Flansch des Schulterstücks eingeklemmt wird. Diese Anordnungen hatten den Nachteil, daß die am Taucherkhelm und am Schulterstück sitzenden, nach außen vorstehenden Dichtungsfleische, die an die Flanche angesetzten Lappen und vollends die zum Zusammenpressen der Flanche dienenden Schrauben beim Gebrauch der Taucherausrüstung sehr hinderlich waren. Um zu verhindern, daß sich die Lappen und unteren Schraubenköpfe am Tauwerk o. dgl. festhaken, wurden dann sogenannte „Freisetzer“ angeordnet, die in schräger Richtung von den Schraubenköpfen nach dem Mantel des Schulterstücks geführt waren. Diese Anordnung war ¹⁰ ¹⁵ ²⁰ ²⁵ ³⁰ ³⁵ ⁴⁰ ⁴⁵ ⁵⁰ ⁵⁵ ⁶⁰ ⁶⁵ ⁷⁰ ⁷⁵ ⁸⁰ ⁸⁵ ⁹⁰ ⁹⁵ ¹⁰⁰ ¹⁰⁵ ¹¹⁰ ¹¹⁵ ¹²⁰ ¹²⁵ ¹³⁰ ¹³⁵ ¹⁴⁰ ¹⁴⁵ ¹⁵⁰ ¹⁵⁵ ¹⁶⁰ ¹⁶⁵ ¹⁷⁰ ¹⁷⁵ ¹⁸⁰ ¹⁸⁵ ¹⁹⁰ ¹⁹⁵ ²⁰⁰ ²⁰⁵ ²¹⁰ ²¹⁵ ²²⁰ ²²⁵ ²³⁰ ²³⁵ ²⁴⁰ ²⁴⁵ ²⁵⁰ ²⁵⁵ ²⁶⁰ ²⁶⁵ ²⁷⁰ ²⁷⁵ ²⁸⁰ ²⁸⁵ ²⁹⁰ ²⁹⁵ ³⁰⁰ ³⁰⁵ ³¹⁰ ³¹⁵ ³²⁰ ³²⁵ ³³⁰ ³³⁵ ³⁴⁰ ³⁴⁵ ³⁵⁰ ³⁵⁵ ³⁶⁰ ³⁶⁵ ³⁷⁰ ³⁷⁵ ³⁸⁰ ³⁸⁵ ³⁹⁰ ³⁹⁵ ⁴⁰⁰ ⁴⁰⁵ ⁴¹⁰ ⁴¹⁵ ⁴²⁰ ⁴²⁵ ⁴³⁰ ⁴³⁵ ⁴⁴⁰ ⁴⁴⁵ ⁴⁵⁰ ⁴⁵⁵ ⁴⁶⁰ ⁴⁶⁵ ⁴⁷⁰ ⁴⁷⁵ ⁴⁸⁰ ⁴⁸⁵ ⁴⁹⁰ ⁴⁹⁵ ⁵⁰⁰ ⁵⁰⁵ ⁵¹⁰ ⁵¹⁵ ⁵²⁰ ⁵²⁵ ⁵³⁰ ⁵³⁵ ⁵⁴⁰ ⁵⁴⁵ ⁵⁵⁰ ⁵⁵⁵ ⁵⁶⁰ ⁵⁶⁵ ⁵⁷⁰ ⁵⁷⁵ ⁵⁸⁰ ⁵⁸⁵ ⁵⁹⁰ ⁵⁹⁵ ⁶⁰⁰ ⁶⁰⁵ ⁶¹⁰ ⁶¹⁵ ⁶²⁰ ⁶²⁵ ⁶³⁰ ⁶³⁵ ⁶⁴⁰ ⁶⁴⁵ ⁶⁵⁰ ⁶⁵⁵ ⁶⁶⁰ ⁶⁶⁵ ⁶⁷⁰ ⁶⁷⁵ ⁶⁸⁰ ⁶⁸⁵ ⁶⁹⁰ ⁶⁹⁵ ⁷⁰⁰ ⁷⁰⁵ ⁷¹⁰ ⁷¹⁵ ⁷²⁰ ⁷²⁵ ⁷³⁰ ⁷³⁵ ⁷⁴⁰ ⁷⁴⁵ ⁷⁵⁰ ⁷⁵⁵ ⁷⁶⁰ ⁷⁶⁵ ⁷⁷⁰ ⁷⁷⁵ ⁷⁸⁰ ⁷⁸⁵ ⁷⁹⁰ ⁷⁹⁵ ⁸⁰⁰ ⁸⁰⁵ ⁸¹⁰ ⁸¹⁵ ⁸²⁰ ⁸²⁵ ⁸³⁰ ⁸³⁵ ⁸⁴⁰ ⁸⁴⁵ ⁸⁵⁰ ⁸⁵⁵ ⁸⁶⁰ ⁸⁶⁵ ⁸⁷⁰ ⁸⁷⁵ ⁸⁸⁰ ⁸⁸⁵ ⁸⁹⁰ ⁸⁹⁵ ⁹⁰⁰ ⁹⁰⁵ ⁹¹⁰ ⁹¹⁵ ⁹²⁰ ⁹²⁵ ⁹³⁰ ⁹³⁵ ⁹⁴⁰ ⁹⁴⁵ ⁹⁵⁰ ⁹⁵⁵ ⁹⁶⁰ ⁹⁶⁵ ⁹⁷⁰ ⁹⁷⁵ ⁹⁸⁰ ⁹⁸⁵ ⁹⁹⁰ ⁹⁹⁵ ¹⁰⁰⁰ ¹⁰⁰⁵ ¹⁰¹⁰ ¹⁰¹⁵ ¹⁰²⁰ ¹⁰²⁵ ¹⁰³⁰ ¹⁰³⁵ ¹⁰⁴⁰ ¹⁰⁴⁵ ¹⁰⁵⁰ ¹⁰⁵⁵ ¹⁰⁶⁰ ¹⁰⁶⁵ ¹⁰⁷⁰ ¹⁰⁷⁵ ¹⁰⁸⁰ ¹⁰⁸⁵ ¹⁰⁹⁰ ¹⁰⁹⁵ ¹¹⁰⁰ ¹¹⁰⁵ ¹¹¹⁰ ¹¹¹⁵ ¹¹²⁰ ¹¹²⁵ ¹¹³⁰ ¹¹³⁵ ¹¹⁴⁰ ¹¹⁴⁵ ¹¹⁵⁰ ¹¹⁵⁵ ¹¹⁶⁰ ¹¹⁶⁵ ¹¹⁷⁰ ¹¹⁷⁵ ¹¹⁸⁰ ¹¹⁸⁵ ¹¹⁹⁰ ¹¹⁹⁵ ¹²⁰⁰ 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"3-bolt-helmet" from Drägerwerk soldered to a 2-bolt breastplate

Denmark, helmets could no longer be produced in Denmark. Instead 2-bolt helmets from Siebe Gorman in London were purchased.

The 2-bolt helmet became synonymous with Danish diving. At the founding of the Dykkehistorisk Selskab it was therefore (as suggested by Peer Haagerup from the Roylea Danish Navy Diving Scholl) obvious to decide on the 2-bolt helmet as a logo for the society.



Thank you to Svend Hessing – son of Kaj Hessing – for the information about the family as well as the loan of photographs. And Thanks to Lene McCormick - daughter of Kjeld Vagn Jensen, one of the first amateur divers in Denmark - for translating the article to English.



Breaststring is placed under the rubber gasket before a diving in Ivigtut, Greenland